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## (54) A dejittering and clock recovery technique for real-time audio/visual network applications

(57) In a real-time audio/visual system in which A/V data is conveyed over a jitter-introducing network, dejittering and clock recovery processes can be achieved without requiring a Phase Locked Loop (PLL). At the server, audio/video streams are encoded into transport packets before being sent out. At the client, the dejittering process is achieved by a dejittering buffer using the embedded timestamps in the transport packets and a client decoding clock. The delay variations of data arriving are removed after the client buffering process. At the

scheduled time, each data packet is shifted to a synchronizing buffer and then fed to the A/V decoder according to the speed of A/V stream. The clock synchronization between client and server is achieved by a synchronizing buffer whose half-size position is taken as the reference. By monitoring the movement of the buffer fill position over a given period, the drift rate of clock unsynchronization between client and server can be derived and, therefore, the client's clock can be adjusted to synchronize with the server's clock based on the derived drift.

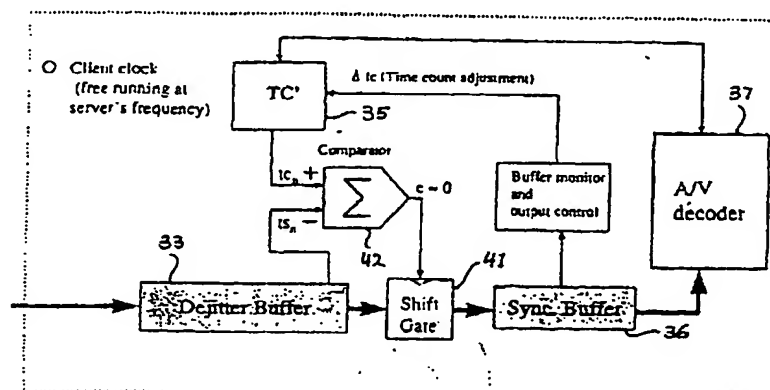


Figure 2

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## EUROPEAN SEARCH REPORT

Application Number  
EP 99 30 4426

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X	US 5 633 871 A (BLOKS RUDOLF H J) 27 May 1997 (1997-05-27)	5	H04N7/24 H04L12/64
A	* abstract * * column 4, line 21 - line 37 * * column 5, line 14 - column 6, line 6 *	1,3,10	
A	WO 95 22233 A (BESSETTE FRANCOIS ;NEWBRIDGE NETWORKS CORP (CA)) 17 August 1995 (1995-08-17) * page 2, line 29 - page 4, line 19 * * page 5, line 30 - page 6, line 22 *	1,2,4-7, 10,11	
A	PALACHARLA S ET AL: "DESIGN AND IMPLEMENTATION OF A REAL-TIME MULTIMEDIA PRESENTATION SYSTEM USING RTP" PROCEEDINGS OF THE ANNUAL INTERNATIONAL COMPUTER SOFTWARE AND APPLICATIONS CONFERENCE (COMPSAC),US,LOS ALAMITOS, IEEE COMP. SOC. PRESS, vol. CONF. 21, 1997, pages 376-381, XP000740025 ISBN: 0-8186-8106-3 * paragraph '0004! *	1,5-9	
A	US 5 790 543 A (CLOUTIER LEO) 4 August 1998 (1998-08-04) * abstract * * column 9, line 35 - column 11, line 29 *	1-3,5,10	H04N H04L
A	EP 0 712 250 A (SONY CORP) 15 May 1996 (1996-05-15) * abstract *	1,2,5,6, 10,11	
A	US 5 640 388 A (HAMMOND MAYNARD D ET AL) 17 June 1997 (1997-06-17) * abstract *	1,5,10	
The present search report has been drawn up for all claims			
Place of search <b>THE HAGUE</b>		Date of completion of the search <b>29 February 2000</b>	Examiner <b>Marie-Julie, J-M</b>
<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons &amp; : member of the same patent family, corresponding document</p>			

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